STATE OF CALIFORNIA Budget Change Proposal - Cover Sheet DF-46 (REV 02/15)

Fiscal Year 2016-17	Business Unit 8570	Department Food and Agriculture	е		Priority No. 10			
Budget Request Name 8570-010-BCP-DP-2016-GB		Program 6590- GENERAL AGRICULTURAL ACTIVITIES		Subprogram				
Budget Request Description Cap and Trade Expenditure Plan - Climate Smart Agriculture								
Budget Request Summary The California Department of Food and Agriculture requests \$75 million in one-time funding in Fiscal Year 2016-17 to be available for encumbrance or expenditure until June 30, 2018 and \$2.523 million in FY 2017-18 and ongoing from the Greenhouse Gas Reduction Fund, and 20.0 ongoing positions. These positions will support ongoing activities promoting greenhouse gas emissions reductions in the agricultural sector through Climate Smart Agriculture programs.								
Requires Legisl	ation ⊠ No		Code Section(s) to be Added/Amended/Repealed					
Does this BCP components?	contain information ☐ Yes No		Department CIO	Department CIO Date				
If yes, departmental Chief Information Officer must sign.								
For IT requests, specify the date a Special Project Report (SPR) or Feasibility Study Report (FSR) was approved by the Department of Technology, or previously by the Department of Finance.								
☐ FSR ☐	SPR	Project No.		Date:				
If proposal affects another department, does other department concur with proposal? Yes No Attach comments of affected department, signed and dated by the department director or designee.								
Prepared By Amrith Gunasel	kara	Date 12/1/15	Reviewed By Kevin Masuhara		Date 12/18/15			
Department Dir	ector	Date 1-4-16	Agency Secreta	Ross	Date 1-5-16			
Department of Finance Use Only								
Additional Review: Capital Outlay ITCU FSCU OSAE CALSTARS Dept. of Technology								
BCP Type:								
PPBA	1 /	6/	Date submitted	I to the Legislature				

BCP Fiscal Detail Sheet

DP Name: 8570-010-BCP-DP-2016-GB

BCP Title: Cap and Trade Expenditure Plan - Climate Smart Agriculture

Budget Request Summary	FY16							
budget Request cullinary	CY	BY	BY+1	BY+2	BY+3	BY+4		
Positions - Permanent	0.0	20.0	20.0	20.0	20.0	20.0		
Total Positions	0.0	20.0	20.0	20.0	20.0	20.0		
Salaries and Wages								
Earnings - Permanent	0	1,334	1,334	1,334	1,334	1,334		
Total Salaries and Wages	\$0	\$1,334	\$1,334	\$1,334	\$1,334	\$1,334		
Total Staff Benefits	0	640	640	640	640	640		
Total Personal Services	\$0	\$1,974	\$1,974	\$1,974	\$1,974	\$1,974		
Operating Expenses and Equipment								
5301 - General Expense	0	18	11	11	11	11		
5302 - Printing	0	3	3	3	3	3		
5304 - Communications	0	21	21	21	21	21		
5306 - Postage	0	3	3	3	3	3		
5320 - Travel: In-State	0	62	62	62	62	62		
5322 - Training	0	5	5	5	5	5		
5324 - Facilities Operation	0	53	53	53	53	53		
5340 - Consulting and Professional Services - External	0	1,450	0	0	0	0		
5342 - Departmental Services	0	382	382	382	382	382		
5346 - Information Technology	0	12	12	12	12	12		
539X - Other	0	47	9	9	9	9		
54XX - Special Items of Expense	0	70,970	0	0	0	0		
Total Operating Expenses and Equipment	\$0	\$73,026	\$561	\$561	\$561	\$561		
Total Budget Request	\$0	\$75,000	\$2,535	\$2,535	\$2,535	\$2,535		
Fund Summary								
Fund Source - State Operations								
3228 - Greenhouse Gas Reduction Fund	0	4,030	2,535	2,535	2,535	2,535		
Total State Operations Expenditures Fund Source - Local Assistance	\$0	\$4,030	\$2,535	\$2,535	\$2,535	\$2,535		
3228 - Greenhouse Gas Reduction Fund	0	70,970	0	0	0	0		
Total Local Assistance Expenditures	\$0	\$70,970	\$0	\$0	\$0	\$0		
Total All Funds	\$0	\$75,000	\$2,535	\$2,535	\$2,535	\$2,535		

Program Summary
Program Funding

Program Funding
6590 - General Agricultural Activities
Total All Programs

 0
 75,000
 2,535
 2,535
 2,535

 \$0
 \$75,000
 \$2,535
 \$2,535
 \$2,535

 \$2,535
 \$2,535
 \$2,535

DP Name: 8570-010-BCP-DP-2016-GB

Personal Services Details

	Sal	ary Informatio	n						
Positions	Min	Mid	Max	<u>CY</u>	<u>BY</u>	<u>BY+1</u>	<u>BY+2</u>	BY+3	<u>BY+4</u>
0762 - Environmental Scientist (Eff. 07-01- 2016)				0.0	5.0	5.0	5.0	5.0	5.0
0764 - Sr Envirnal Scientist (Supvry) (Eff. 07- 01-2016)				0.0	1.0	1.0	1.0	1.0	1.0
0765 - Sr Envirnal Scientist (Spec) (Eff. 07- 01-2016)				0.0	3.0	3.0	3.0	3.0	3.0
4800 - Staff Svcs Mgr I (Eff. 07-01-2016)				0.0	1.0	1.0	1.0	1.0	1.0
5393 - Assoc Govtl Program Analyst (Eff. 07- 01-2016)				0.0	9.0	9.0	9.0	9.0	9.0
6969 - Special Asst (Eff. 07-01-2016)				0.0	1.0	1.0	1.0	1.0	1.0
Total Positions			-	0.0	20.0	20.0	20.0	20.0	20.0
Salaries and Wages	CY	BY	BY+1	BY	BY+2 BY+3		BY+4		
0762 - Environmental Scientist (Eff. 07-01- 2016)	0	277	277		277		277		277
0764 - Sr Envirnal Scientist (Supvry) (Eff. 07- 01-2016)	0	107	107		107		107		107
0765 - Sr Envirnal Scientist (Spec) (Eff. 07- 01-2016)	0	226	226		226		226		226
4800 - Staff Svcs Mgr I (Eff. 07-01-2016)	0	72	72		72		72		72
5393 - Assoc Govtl Program Analyst (Eff. 07- 01-2016)	0	559	559		559		559		559
6969 - Special Asst (Eff. 07-01-2016)	0	93	93		93		93		93
Total Salaries and Wages	\$0	\$1,334	\$1,334	:	\$1,334		\$1,334		\$1,334
Staff Benefits									
5150900 - Staff Benefits - Other	0	640	640		640		640		640
Total Staff Benefits	\$0	\$640	\$640		\$640		\$640		\$640
Total Personal Services	\$0	\$1,974	\$1,974	;	\$1,974		\$1,974		\$1,974

A. Budget Request Summary

The CDFA requests \$75 million in one-time funding in FY 2016-17 to be available for encumbrance or expenditure until June 30, 2018 and \$2.523 million in FY 2017-18 and ongoing from the GGRF, and 20.0 ongoing positions. These positions will support ongoing activities promoting GHG emissions reductions in the agricultural sector through three programs that tie into Climate Smart Agriculture. Climate Smart Agriculture is an integrated approach to achieve GHG reductions while also ensuring food security in the face of climate change. A suite of ready-to-implement management practices, such as carbon sequestration in agricultural soils, managing manure in dairies to reduce GHGs, and increasing the efficiency of on-farm water and energy use can achieve these goals across diverse agricultural systems. The requested funding will support the following Climate Smart Agriculture programs: \$20 million to continue CDFA's existing State Water Efficiency and Enhancement Program (SWEEP) which provides financial incentives to growers to implement water distribution systems on farms that reduce GHGs and save water; \$35 million to continue CDFA's existing Dairy Digester Research and Development Program to provide financial assistance for the implementation of dairy digesters and other management practices that result in reduced GHG methane emissions (a short-lived climate pollutant and a criteria pollutant) and provide other environmental benefits; and \$20 million to develop and administer a new CDFA incentive and demonstration program on the state's Healthy Soils Initiative, which is designed to capture atmospheric carbon and increase carbon levels in California agricultural soils.

B. Background/History

The Global Warming Solutions Act of 2006 (Chapter 488, Statutes of 2006) requires California to reduce statewide GHG emissions to 1990 levels by 2020 and continue further reductions beyond 2020. The Air Resources Board (ARB) has developed a market-based Cap and Trade Program as a key element of its overall GHG reduction strategy. The program establishes a statewide emissions limit on the sources responsible for 85 percent of GHGs and creates a financial incentive for investment in clean and efficient technologies. The backbone of the Cap and Trade regulation is the system of tradable permits to emit GHGs known as 'allowances.' Because a market to exchange these allowances exists between entities, including those covered by the regulation, these allowances have value. Under the program, a portion of the allowances required for compliance are being sold at auction and deposited in the GGRF. The first auction was held in November 2012, and auctions will be conducted quarterly through 2020. Proceeds from these auctions are used to fund projects that support efforts to reduce GHG emissions.

"Implementation of the California Global Warming Solutions Act of 2006 (AB 32) includes measures that achieve real, quantifiable, cost-effective reductions of GHG emissions and return California to 1990 emission levels by 2020. Since 2006, the state has continued to steadily implement a set of actions that are driving down GHG emissions, cleaning the air, diversifying the energy and fuels that power our society, spurring innovation in a range of advanced technologies and improving natural resource health statewide. These efforts have put California on course to achieve the 2020 emissions limit, and have created a framework for ongoing climate action that can be built upon to maintain and continue reductions beyond 2020. In addition to the near-term GHG emission reduction goals established in AB 32, mid-term and longer-term GHG emission reduction targets have been established in Executive Orders B-30-15 and S-3-05 to reduce greenhouse gas emissions by 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050, respectively. The Greenhouse Gas Reduction Fund (GGRF -funded by the Cap-and-Trade Program generated Auction Proceeds, authorized by AB 32) has been established for the purpose of funding measures that allow California to achieve its GHG reduction goals, furthering the purposes of AB 32. In addition, SB 535 (de León, Chapter 830, Statutes of 2012) requires that twenty-five percent of GGRF funds are spent to benefit designated disadvantaged communities, and ten percent must be spent within disadvantaged communities."

Beginning in Fiscal Year (FY) 2013-14 and continuing through FY 2015-16, CDFA has utilized GGRF funding to support several critical Climate Smart Agriculture programs designed to reduce climate change and provide a multitude of other important environmental benefits including carbon sequestration.

C. State Level Considerations

The state has allocated GGRF funds to assist with the ongoing drought and climate change mitigation. Among the state organizations, CDFA is the primary agent that interfaces with the agricultural sector, so it is appropriate that CDFA take the lead on GHG reduction activities in this arena.

On April 29, 2015, the Governor issued Executive Order B-30-15 establishing a mid-term GHG reduction target for California of 40 percent below 1990 levels by 2030. All state agencies with jurisdiction over sources of GHG emissions were directed to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 targets. In order to achieve the 2030 target, the following four strategies will be impacted by the programs proposed. These strategies are: 1) achieving 50 percent renewable energy by 2030, 2) carbon sequestration in the land base, 3) reduce short-lived climate pollutants, and 4) safeguard California. The three programs proposed here all contribute to at least one of these strategies to achieve the 2030 and 2050 goals. For example, the Dairy Digester Research and Development Program is a program established by CDFA that is consistent with strategies 1 and 3 by achieving renewable energy generation from the reduction of the short-lived climate pollutant and a criteria pollutant (methane) from dairy operations in California. Further, supporting strategy 4 is SWEEP which will result in water savings and GHG reductions which is critical to addressing agricultural water use in consideration of historic drought conditions. A CDFA funded study showed that approximately 564,000 acres of land was fallowed in 2015 and current economic losses from the drought are estimated at \$2.7 billion with approximately 18,600 full-time, part-time, and seasonal job losses.

In further implementing SWEEP and the Dairy Digester Research and Development Program, CDFA will continue to work with other state agencies and entities in administering the programs. For example, SWEEP is heavily dependent on multiple collaborations at the state, university and local level. SWEEP, according to statute, must work closely with the Department of Water Resources and the State Water Board while utilizing numerous partners such as experts from the University of California, state institutions and Resource Conservation Districts. A key component of the Dairy Digester Research and Development Program include the Technical Advisory Committee (TAC). TAC is composed of technical experts from several agencies including the California Energy Commission, Air Resources Board, CalRecycle, and several other state agencies. TAC is responsible for the review and ranking of applications for funding consideration by the Secretary. These collaborations are designed to better integrate multiple GGRF resources at both the state and local level. CDFA will continue to maintain these collaborations and look to establish additional partnerships as part of the proposed work in this proposal.

The importance of healthy soils was recently recognized when Governor Brown stated in the FY 2015-16 proposed January budget, "as the leading agricultural state in the nation, it is important for California's soils to be sustainable and resilient to climate change. Increased carbon in soils is responsible for numerous benefits including increased water holding capacity, increased crop yields and decreased sediment erosion. In the upcoming year, the Administration will work on several new initiatives to increase carbon in soil and establish long term goals for carbon levels in all California's agricultural soils. CDFA will coordinate this initiative under its existing authority provided by the Environmental Farming Act." The programs are also consistent with the five principles of the state's climate strategies of creating jobs, saving water, transforming to a clean energy economy, making California resilient to climate change, and supporting vulnerable communities since many agriculture operations are in regions with disadvantaged communities.

CDFA is the primary agency that collaborates on all agronomic issues, including soil health, with other state agencies, federal and local government, the environmental community and the agricultural industry. CDFA will continue to work with ARB and other state agencies on all GHG reduction programs including the quantification methodologies. In addition, CDFA will collaborate with California Department of Resources Recycling and Recovery (CalRecycle) and the California Department of Conservation to ensure that CDFA's Healthy Soils Initiative demonstration projects and grants complement existing soil-land conservation activities.

¹ Food and Agricultural Code, Article 8.5, Sections 560-568

D. Justification

This proposal will support CDFA's continuation of the SWEEP and Dairy Digester Research and Development Programs and the implementation of a new Healthy Soils Program to reduce GHG emissions, save water and increase the sequestration of atmospheric carbon in soils on California agricultural operations.

One Associate Governmental Program Analyst (AGPA), working with the three Climate Smart Agriculture programs, will be responsible for media communications, promotional activities, information dissemination and stakeholder outreach. This position will be critical to ensure that growers know about CDFA's Climate Smart Agriculture programs and will highlight the accomplishments of the program to a wide audience including development and distribution of information to the Legislature.

Statewide Water and Efficiency Enhancement Program

This proposal requests one-time funding of \$20 million in GGRF for CDFA to continue SWEEP in FY 2016-17 and FY 2017-18 with projects to be completed by the end of FY 2018-19.

California is the nation's leading agricultural production state in terms of crop production and diversity. This agricultural production is critical to food security. Water is an essential component of agricultural food production, and inefficient water distribution practices result in the emission of GHGs through increased fossil fuel use. In February 2014, the Legislature passed Senate Bill (SB) 103 (Chapter 2, Statutes of 2014) which was signed into law by the Governor, and allocated \$10 million in GGRF to CDFA "to provide financial incentives to agricultural operations to invest in water irrigation treatment and distribution systems that will reduce greenhouse gas emissions, and will also reduce water and energy use, augment supply, and increase water and energy efficiency in agricultural applications." The program has become a cornerstone of the Climate Smart Agriculture platform at CDFA by achieving the multiple objectives of ensuring agricultural food and economic sustainability, food security in consideration of climate change and climate change mitigation by reducing GHGs.

Consistent with this directive, CDFA established a competitive grants program to allocate financial incentives to growers who have the largest water and GHG savings by implementing water distribution irrigation systems on their farms. The grant application process includes approval from a technical review team composed of irrigation system experts at the University of California and California State University systems. The program also includes a verification component supported by the California Resource Conservation Districts (RCD).

Initial funding appropriated for SB 103 was used in a competitive grant application process in FY 2014-15. CDFA received applications for 453 projects totaling \$33.4 million. CDFA funded 133 projects from the FY 2014-15 allocation which leveraged approximately \$5.9 million in matching funds. The implemented projects resulted in an estimated 51,600 Tonnes CO₂ equivalent/year of GHG reductions and 24,500 acre feet/year in water savings. In March 2015, Assembly Bill 91 (Chapter 1, Statutes of 2015) accelerated \$10 million of the \$16 million budgeted from the GGRF in 2015-16 for the second year of CDFA's 2014-15 GHG reduction proposals, and reallocated it to the SWEEP program. This \$10 million became part of the 2014-15 Budget Act, and is available for encumbrance or expenditure until June 30, 2016. CDFA received applications for 345 projects totaling \$30.3 million and has funded 100 projects totaling \$9.5 million through 2014-15. The Budget Act of 2015 (SB 101, Chapter 321, Statutes of 2015) appropriated an additional \$40 million from the GGRF for SWEEP activities. CDFA is in the process of soliciting applications to allocate these funds under the same objectives as the previous funding allocations of saving water and reducing GHGs from irrigation systems on agricultural operations.

SWEEP was developed to incentivize several different strategies to reduce GHGs and save water. The strategies that were incentivized, in addition to requiring water savings and GHG reductions, were: 1) weather, soil or plant based sensors for irrigation scheduling to guide agricultural operators in applying water when the plant needs it, 2) micro-irrigation or drip systems to support water application to the plant root zone, 3) fuel conversion on pumps from fossil fuels to electricity and renewable energy sources, 4) improved energy efficiency for water pumps, 5) low pressure irrigation systems that reduce energy use, 6) use of Variable

Frequency Drives (VFD) to reduce energy use and match pump flow to load requirements and 7) reduced pumping to save energy and reduced GHGs. Applicants to the program are encouraged to use several project types listed above in order for a proposed project to achieve both GHG emission reductions and water savings. The aforementioned strategies were widely used in the funded projects from FY 2014-15, and will continue to be utilized as the program continues.

Data analysis for the FY 2014-15 projects show that approximately 67 percent of the projects used soil moisture sensors with electronic data output and flow meter linked to irrigation controllers for irrigation scheduling to save water and GHG from reduce pumping, 37 percent used micro-irrigation or drip systems to save water and reduce GHGs, 26 percent reduced GHGs from water pumping including conversion of energy used for pumps from fossil fuels to renewable energy such as solar, 28 percent of the projects used evapotranspiration (ET) based irrigation scheduling, such as California Irrigation Management Information System (CIMIS) to save water and GHGs, and 15 percent used VFD pumps to reduce energy use and match pump flow to load requirements. Approximately 48 percent of projects utilized multiple strategies to save water and reduce GHGs which was consistent with the design of the program. Also, SWEEP was supported by \$5.9 million in cost share dollars by growers for the approximately \$9.5 million which has been allocated so far for competitive grants from the GGRF for FY 2014-15.

At present, approximately 57 percent of farms have some sort of efficient irrigation system designed to save water. These systems use scientifically tested irrigation systems such as drip and micro-sprinkler systems to provide only the required amount of water to plants for food crop production. Providing financial assistance to growers to help to convert some of the remaining farms with inefficient systems to efficient irrigation systems will result in saving water and the reduction of GHGs. It should be noted that these types of irrigation systems are not appropriate for all commodities or agricultural operations. For instance, flood irrigation can recharge depleted groundwater basins, improve the water quality in those basins and provides valuable wildlife habitat.

With CDFA's initial \$10 million SWEEP allocation, CDFA estimates annual water savings at 24,500 acre feet and 51,600 Tonnes CO2 equivalent. In addition, CDFA was able to leverage \$5.9 million in cost share dollars for the \$9.5 million provided by the state. In consideration of the current drought, the FY 2014-15 program cost share investments made, water saved, GHGs reduced, acreage on which projects were implemented, and the fact that CDFA was unable to fund all of the grant applications received due to funding limitations, the state should continue to fund this valuable program.

Of the \$20 million requested for SWEEP in this proposal, approximately \$19 million will be used for incentives, and the remaining \$1 million will be used for administrative costs, including university technical review of grant projects, RCD staffing costs associated with project verification assistance, and CDFA staffing costs associated with scientific technical project oversight and grant administration. CDFA estimates that with the additional funding requested in this proposal, it will be able to fund approximately 140-200 projects.

This proposal requests four positions for SWEEP.

- Two AGPAs will be required to oversee the distribution of approximately \$19 million in incentives
 (approximately 140-200 grants). The AGPAs will be responsible for preparing grant application
 packages for applicants; administering the solicitation process; preparing grant materials, application
 processes, and implementation procedures; coordinating and overseeing the review process with the
 external review team; finalizing, monitoring and tracking agreements and payments; and closing out
 projects.
- Two Environmental Scientists (ES) will be the scientific and technical personnel responsible for new solicitations under SWEEP. The two ES will act as regional coordinators (Northern and Southern California) and will be responsible for performing post-project GHG verification activities for SWEEP recipients in conjunction with local RCDs. They will also be the primary contacts for farmers on issues related to water and GHG scientific and technical SWEEP information.

Dairy Digester Research and Development Program

This proposal requests one-time funding of \$35 million in GGRF for CDFA to continue its GGRF Dairy Digester Research and Development Program activities.

The Dairy Digester Research and Development Program is a cornerstone program of CDFA's Climate Smart Agriculture platform. Dairy Digesters are designed to reduce GHGs by capturing methane, a short-lived climate pollutant and a criteria climate pollutant identified by ARB that is emitted from dairy operations before it escapes into the atmosphere in order to convert it into energy in the form of electricity and a renewable fuel. This also benefits California's efforts to limit climate change since Dairy Digesters are a low carbon biofuel which can replace high carbon energy sources used for fuel in the transportation sector which is responsible for 40 percent of all GHG emissions in California. In addition, the Dairy Digester Research and Development Program supports the Natural Resources and Waste Diversion investment plan by reducing GHG emissions associated with dairy production, waste and byproduct reuse and land management, lessening the impacts and effects of climate change on the state's communities, economy and environment.

Methane gas emitted from dairy operations is approximately 21 times more potent than carbon dioxide as a GHG and is a short-lived and criteria climate pollutant. ARB has classified methane GHG as a short-lived climate pollutant and it is globally recognized as a criteria climate pollutant. According to ARB short-lived climate pollutants such as methane "are powerful climate forcers that remain in the atmosphere for a much shorter period of time than longer-lived climate pollutants, such as carbon dioxide. Their relative potency, when measured in terms of how they heat the atmosphere, can be tens, hundreds, or even thousands of times greater than that of CO2. Reducing these emissions can make an immediate beneficial impact on climate change." Dairy digesters capture methane gas at dairy farms and convert it into energy in the form of electricity or fuel. Harnessing this potent GHG prevents it from contributing to climate change while at the same time producing a renewable energy supply which also supports the state's renewable portfolio standard of achieving 33 percent total energy procurements from renewable sources by 2020. The recent scoping plan update hopes to achieve 50 percent total energy procurement from renewable sources by 2050. These goals are achievable through dairy digesters and other management practices on dairy operations that reduce methane GHGs. An additional benefit is this renewable methane energy source is considered a low carbon "biofuel" source. Introduction of biofuels into commercial applications will generate significant GHG reductions from the transportation sector which is responsible for 40 percent of the total GHG emissions inventory in California. Despite having the largest number of dairies of any state, there are less than 20 dairy digesters in operation in California. However, the potential for dairy digesters operations has been numbered at approximately 2,000 operations within the state. Presently, there are more digesters in operation in New York, a state which has far fewer dairy operations than California.

In FY 2014-15, the Legislature appropriated \$12 million for CDFA's Dairy Digester Research and Development Program to provide financial assistance for the installation of dairy digesters on dairy operations in California and to fund related research which will result in reduced methane GHG emissions. CDFA engaged in a comprehensive competitive grants program and utilized scientific expertise at the University of California and California State University systems to fund five dairy digester projects totaling approximately \$11 million with a matching fund contribution of \$18.9 million. All funded projects are located in disadvantaged communities in California as defined by the California Communities Environmental Health Screening Tool (CalEnviroScreen). In total, CDFA received 12 applications totaling approximately \$28 million which indicated a clear demand for implementing dairy digesters on California dairies. Future funds will continue to fund dairy digesters on California dairies and expand the program to incentivize other management practices that have quantifiable methane criteria pollutant GHG reductions such as incentivizing the conversion of liquid slurry based dairy manure operations to solid manure management systems. Research with quantifiable GHG reductions will also be funded.

The California-Federal Dairy Digester Working Group (a multi-stake holder group consisting of state, federal, dairy industry and environmental professionals) identified three primary barriers to the wide-scale development of dairy digesters in California: regulatory, economic and technical. To address these issues, the Working Group developed a series of recommendations to advance dairy digester development in California. The recommendations included: establishing of a dairy digester research and development program with dedicated

funding, establishing a dairy renewable bioenergy development target to be achieved by 2016, supporting research on technical issues and co-benefits, and improving regulatory efficiency. These recommendations became the focus for CDFA's Dairy Digester Research and Development Program which was expanded with the receipt of GGRF funding in FY 2014-15. This proposal will provide funding to build upon the program's efforts that began in FY 2014-15 and allow the program to continue to grow.

Of the \$35 million requested, \$1 million would be used to fund research and demonstration grants focused on efforts to reduce GHG emissions, facilitate improved understanding of the scientific and technical aspects of dairy digesters, and provide information about economic feasibility, widespread implementation and environmental benefits of dairy digesters; approximately \$33 million would be available to fund dairy digester development projects and fund other management practices that reduce methane (such as incentivizing the conversion of liquid slurry systems to dry-scrape manure management systems). The remaining funding would cover CDFA staffing costs associated with scientific technical project oversight and grant administration. CDFA estimates that this proposal will fund approximately 10-15 additional competitive dairy digester development grants to support the design, planning and construction of dairy digesters. CDFA will also utilize part of the \$33 million to fund management practices that can reduce short-lived climate pollutants from dairy operations. CDFA will examine the economic costs of specific management practices prior to allocation of funds to incentivize management practice changes on dairy operations.

The Dairy Digester Research and Development Program will reduce GHGs through the deployment and research of innovative technologies, measures, and practices to produce renewable energy and fuel from dairy manure solid waste producing quantifiable, documentable GHG reductions and clean energy. In addition, many of the disadvantaged communities identified in CalEnviroScreen are in the Central Valley where the majority of California's dairy operations are located. The implementation of the Dairy Digester Research and Development Program will ensure multiple benefits to the environment and California citizens, including reducing a potent GHG, improving air and water quality, renewable energy and fuels, managing nutrients, promoting energy security, waste diversion, distributed energy production, and stimulating jobs and economic development.

This proposal requests four positions under the Dairy Digester Research and Development Program.

- One Special Assistant will oversee the continued program development and implementation of the Dairy Digester Research and Development Program in coordination with two programmatic staff that will provide issue area expertise. This position will be responsible for program oversight, intradepartmental coordination, and all Legislative and ARB GHG required reporting. This function is a continuation of what was originally approved in CDFA's FY 2014-15 GHG Emission Reductions through Agriculture Phase I BCP.
- One AGPA will be assigned to the Dairy Digester Research and Development Program to oversee the
 distribution of approximately \$33 million in grants for Dairy Digester development projects (\$1 million
 will be used for fund research and \$1 million for administrative costs). The AGPA will be responsible
 for preparing grant application packages for applicants; administering the solicitation process; preparing
 grant materials, application processes, and implementation procedures; coordinating and overseeing
 the review process with the external review team; finalizing, monitoring and tracking agreements and
 payments; and closing out projects.
- One Senior Environmental Scientist (Specialist) is required to be lead scientific and technical subject
 matter expert of the Dairy Digester Research and Development Program. Lead scientific expertise is
 required on the GHG quantification methodology, data collection, reporting of final GHG reduction
 values in reports to ARB and site validation of GHG reductions.
- One ES will be required to provide scientific oversight and direction for the Dairy Digester Research
 and Development Program. This function is a continuation of what was originally approved in CDFA's
 FY 2014-15 GHG Emission Reductions through Agriculture BCP. In addition to providing scientific
 expertise in the program, the ES will conduct all outreach activities and lead stakeholder meetings to
 effectively communicate the scientific and technical requirements of the program. These functions
 include assisting the Grants Management staff in addressing scientific technical questions associated
 with projects.

Healthy Soils Program

This proposal requests \$20 million in GGRF for CDFA to implement a new Healthy Soils Program designed to reduce GHG emissions and increase carbon sequestration through better soil management practices. This program is also an important program that is under the umbrella of the Climate Smart Agriculture platform at CDFA.

California is the nation's leading agricultural production state in terms of crop production and diversity. Soils are the fundamental medium for crop growth and therefore essential for food production. Ensuring soils are healthy, with adequate levels of carbon, is critical for long-term agriculture sustainability and food security. Soils offer the potential to capture atmospheric carbon dioxide GHGs emitted from both the agricultural sector and other non-agricultural sectors, and sequester that carbon in soil and woody plant material on agriculture farms and ranches. Soil health also provides many other benefits, such as increased water and nutrient holding capacity, improving drought resiliency, greater microbial diversity and increased soil structure and stability which reduces sediment erosion into surface waters. Soil health programs, as proposed here, are often used in Climate Smart Agriculture incentive programs in other nations and designed to ensure food security, agricultural food and economic sustainability and reduction of GHGs.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has developed National Conservation Practice Standards for implementing conservation measures to improve the environmental quality of agricultural lands. In California, these management practices have not historically been implemented for atmospheric GHG reductions on farms because quantitative data on related GHG reductions for each management practice had not been defined. Recently, in coordination with CDFA, USDA NRCS developed GHG reduction values for several Conservation Practice Standards that are designed to build carbon in agricultural systems. The GHG reduction values were assigned to a select list of Conservation Practice Standards using the Intergovernmental Panel on Climate Change Tier 1 best available science data. CDFA has identified that these Conservation Practice Standards can be used to incentivize farmers and ranchers to reduce atmospheric carbon dioxide. CDFA, through a scientific and quantitative process, will evaluate the proposals on a competitive level and provide financial incentives to implement the project. The cost of implementation per management practices has been developed for each Conservation Practice Standard by USDA NRCS. Following project implementation, CDFA will verify the GHG reductions through post-project site visits to quantify and verify the GHG reductions.

CDFA will also utilize the funds to establish demonstration projects that have quantifiable GHG reductions. Demonstration projects bring growers together at field sites that have implemented specific management practices, based on sound science, to build carbon in soils and woody plant materials. Demonstration projects encourage the voluntary implementation of management practices by farmers who observe the practice in action on their individual agricultural operations, while increasing the rate of adoption in the agricultural sector. CDFA envisions demonstration projects to be implemented by third party entities including the University of California and the California State University systems. Demonstration projects and an incentive-based program are foundational elements of the state's Healthy Soils Initiative.

Agriculture contributes to the production of GHGs in a variety of ways, including the use of farm equipment, the transportation of water, and the application of nitrogen-rich fertilizers. Poor soil health is of particular concern, since soils are the fundamental medium for crop growth and therefore, food production, and is related to the production of GHGs. Soils, in general, have become depleted of important carbon pools and plant nutrients over time. These carbon pools and nutrients are essential for food production and long term agricultural sustainability. The carbon and nutrient pools in soils are classified together as soil organic matter (SOM). The loss of SOM over time will eventually lead to a growing medium that is not capable of supporting plant growth, and therefore food production, without considerable synthetic inputs such as nitrogen-rich fertilizers and increased use of pesticides. This loss of SOM also has many other consequences such as reduced water holding capacity and increased erosion to dust which makes food production vulnerable to droughts and other climate change related impacts.

Certain practices, such as mulching can add high carbon, low nitrogen, organic matter amendments to the soil to increase SOM and reduce the need for fertilizer and additional water. The Compost Emission Reduction Factor recently adopted by ARB assign quantifiable GHG reductions to the use of this and other soil management practices that reduce the production of GHGs and increase SOM.

In addition, soils are also an underutilized natural resource that can reduce atmospheric carbon dioxide greenhouse gases. Agriculture offers the potential to capture atmospheric carbon dioxide greenhouse gases emitted from both the agricultural sector and other sectors, and sequester that carbon in soil and woody plant material, while at the same time providing many other benefits, such as improving soil health by increasing SOM. The aforementioned National Conservation Practice Standards have now been tied to quantifiable GHG reduction values that can be used to incentivize these practices for farmers.

Of the \$20 million requested for the Healthy Soils Program in this proposal, approximately \$13.8 million will be used for incentives to farmers to utilize selected National Conservation Practices that will reduce GHGs and promote soil health, \$4 million will be used for demonstration projects that encourage compost use and other farm management practices that build soil health and reduce GHGs, and the remaining \$2.2 million will be used for costs associated with initial program development, design and administration. Administrative costs include university technical review of grant applications, RCD staffing costs associated with project verification assistance, and CDFA staffing costs associated with scientific technical project oversight and grant administration. CDFA estimates that this proposal will fund between 700 and 2,200 projects.

This proposal requests eleven positions for Healthy Soils.

- One Staff Services Manager I (SSM I) and five AGPAs will be assigned to the Healthy Soils Program to oversee distribution of \$4 million in demonstration projects and \$13.8 million in incentives. The SSM I will supervise and direct the work of the five AGPAs, coordinate with program staff, and be responsible for preparing consolidated reports and overall project fund management. The AGPAs will be responsible for preparing grant application packages for applicants; administering the solicitation process; preparing grant materials, application processes, and implementation procedures; coordinating and overseeing the review process with the external review team; finalizing, monitoring and tracking agreements and payments; and closing out projects.
- One Senior Environmental Scientist Supervisor, two Senior Environmental Scientists (Specialists), and two ES will be required to provide scientific oversight and direction for the Healthy Soils Program.
 These scientists will assist in developing all technical and scientific components of the program, implementation, stakeholder outreach including leading workshops, application review and GHG quantification and post-project quantification for GHG reduction and carbon sequestration values.

E. Outcomes and Accountability

Grant, Incentive, and Demonstration Projects

All grant, incentive, and demonstration projects will be implemented in consultation with any appropriate state agencies (Department of Water Resources (DWR), State Water Resources Control Board (SWRCB), CalRecycle, etc.). CDFA will work closely with ARB to develop quantification methodology for GHG reductions associated with all projects. All project outcomes will be included in the grant agreement that will be verified by technical staff from CDFA and/or the RCDs. All projects will calculate and report on associated GHG reductions, as well as any other identified added benefits specified by CDFA (water savings, benefits to disadvantaged communities, etc.). All GGRF funded CDFA programs will be consistent with SB 535 disadvantage community (DACs) targets of 25%. To date, all GGRF funded CDFA programs have met or exceeded this standard. The vast majority of agricultural operations are located in the Central Valley which is identified on CalEnviroScreen as some of the most impacted DACs. All outcomes will be listed in an annual report that will be publicly available as part of departmental accountability processes and requirements associated with the use of funds from the GGRF. The report will include, in addition to the quantitative greenhouse gas reductions, any quantitative variables.

Each program will prepare quarterly progress reports. In addition, a CDFA internal auditor will audit the programs in this proposal to ensure program integrity and compliance with financial policies and procedures. CDFA will continue to work in conjunction with the Department of Finance and ARB for all GHG related programs to ensure all GHG reporting requirements are met, and programs are in compliance with GGRF related mandates.

F. Analysis of All Feasible Alternatives

Alternative #1: Approve \$75 million in one-time funding in FY 2016-17 to be available for encumbrance or expenditure until June 30, 2018 and \$2.523 million in FY 2017-18 and ongoing from the GGRF, and 20.0 ongoing positions to support CDFA's SWEEP, Dairy Digester Research and Development Program, and Healthy Soils Program in order to reduce GHGs in the agricultural sector.

Advantages: Implementation of this proposal will not only result in reduced GHGs, limit climate change and support Climate Smart Agriculture but will also provide a myriad of other benefits to the state, including substantial water savings needed during California's drought, the generation of cleaner renewable energy sources, and increased soil health that will reduce GHGs by sequestering carbon, helping to ensure adequate food production in California and support national food security.

Disadvantages: This alternative increases the obligation to the GGRF.

Alternative #2: Do not approve \$75 million in one-time funding from the GGRF or 20.0 positions to implement programs identified in this proposal.

Advantages: There would be no obligation to the GGRF.

Disadvantages: CDFA is the primary agency that collaborates on agricultural issues with other state agencies, federal and local government, the environmental community and the agricultural industry. Without additional funding CDFA will no longer be able to fund the SWEEP and Dairy Digester Programs and the state will not realize the GHG and water savings associated with these programs. In addition, CDFA will not be able to begin to implement GHG related components of the Healthy Soils initiative to promote agricultural practices which will increase SOM and improve soil health.

Alternative #3: Pursue funding from the agricultural industry.

Advantages: There would be no obligation to the GGRF.

Disadvantages: Under the current program structure, some industry funding is already leveraged for the SWEEP and Dairy Digester Research and Development programs. While the agricultural industry is in general interested in these programs, the existing drought and other recent challenges such as water resources and invasive pests and diseases have taken precedence over funding these initiatives. Agriculture is investing heavily in mitigating existing climate change related impacts such as the current drought. Given the current challenges facing agriculture, the industry is not in a position to financially support this proposal.

G. Implementation Plan

<u>SWEEP</u>

- July to August 2016: Establish contract with SWRCB to use online application system
- July to September 2016: Update and finalize grant solicitation guidelines and electronic application
- July to September 2016: Identify, interview and hire CDFA Grants Office and scientific personnel
- September 2016: Utilize the Environmental Farming Act Science Advisory Panel to review and obtain feedback on any changes to the existing SWEEP guidelines
- October to December 2016: Organize public workshops on application guidelines and announce availability of funds for SWEEP
- November 2016: Consult with DWR, SWRCB, and ARB on SWEEP guidelines and GHG metrics

- November 2016 to January 2017: Announce funding availability for SWEEP to agricultural stakeholders and farmers
- January to February 2017: Obtain applications by growers for funding
- February to March 2017: Complete technical review of applications including the evaluation of water savings and GHG reductions by University irrigation system experts
- April 2017: Announce awardees for FY 2016-17 SWEEP funds
- May 2017: Establish contracts with growers
- June 2017 to May 2018: Project implementation by growers
- December 2017 to May 2018: Project verification by CDFA and RCDs
- June 2018: Final invoicing and project completion
- July 2018: Completion of final report with quantitative water and GHG savings

Dairy Digester Research and Development

Phase I (Digester Development)-

- July to August 2016: Review and modify dairy digester guidelines, consult with Dairy Digester Technical Advisory Committee, conduct stakeholder workshops and establish third party technical review teams with academic institutions
- July to September 2016: Identify, interview and hire Dairy Digester Research and Development personnel
- August to September 2016: Distribute dairy digester solicitations, conduct application workshops
- September to October 2016: Department administrative review and third party technical review team evaluation of dairy digester implementation proposals
- October to November 2016: Dairy Digester Technical Advisory Committee evaluation and scoring of dairy digester proposals
- December 2016 to January 2017: Award dairy digester grants
- January 2017 to January 2018: Project implementation by dairy digester developers/dairy producers
- January 2017 to January 2018: CDFA will continually: review invoices, verify expenditures, and provide
 payments to contractors; provide information to ARB as requested to comply with GGRF reporting
 requirements, conducts site visits, review quarterly reports during the term of the project and final
 performance report
- February to March 2018: Projection verification by CDFA
- April to June 2018: Completion of final report with quantitative GHG reductions

Phase II (Research)-

- November to December 2016: Review and modify research guidelines, consult with Dairy Digester Technical Advisory Committee
- December 2016 to January 2017: Distribute dairy digester research solicitation
- January to February 2017: Scientific Peer Review Evaluation of proposals
- February to March 2017: Dairy Digester Technical Advisory Committee evaluation and scoring of dairy digester research proposals
- April 2017: Award dairy digester research grants
- April 2017 to May 2018: Research projects implementation
- April 2017 to May 2018: CDFA reviews progress reports
- May 2018: Final invoicing and project verification
- June 2018: Completion of final report with research project summaries and quantitative GHG reductions

Healthy Soils

- July to September 2016: Identify, interview and hire CDFA Healthy Soils personnel
- July to October 2016: Organize stakeholder meetings to solicit feedback on established scope and goals of the CDFA Healthy Soils Program and the need to reduce on-farm and atmospheric GHGs

- July to October 2016: Identify, interview and hire CDFA Grants Office personnel to allocate grants, contracts and invoicing for the Healthy Soils Program incentives component that will incentivize on-farm management practices to reduce on-farm and atmospheric GHGs
- July to October 2016: Identify, interview and hire CDFA Healthy Soils Scientists to assist in GHG metric development and project verifications for the incentives component of the initiative
- July to December 2016: Utilize the Environmental Farming Act Science Advisory Panel to review and obtain feedback on management practices that could build soil organic matter and reduce on-farm and atmospheric GHGs
- July to December 2016: Utilize GHG Environmental Farming Act Science Advisory Panel to provide feedback on developed guidelines for the incentives component of the Healthy Soils Initiative that will reduce GHGs
- September 2016 to June 2018: Convene interagency meetings to update other state agencies on actions related to the reducing GHGs from the Healthy Soil Initiative and discuss potential actions initiated by other agencies
- December 2016 to February 2017: Develop guidelines for the incentives component of the Healthy Soil Initiative that will be designed to reduce GHGs
- December 2016 to March 2017: Organize public meetings for stakeholder input on the incentives component of the program including review of the application guidelines for reducing on-farm and atmospheric GHGs
- December 2016 to March 2017: Explore and identify user-friend tools for use by farmers and agricultural support services that reduced GHGs on-farm and from the atmosphere by specific management practices
- December 2016 to January 2018: Organize and implement demonstration projects to highlight the reduction of GHGs by on-farm management practices.
- March to April 2017: Announce and open application process for availability for incentives component of the Healthy Soils Initiative to agricultural stakeholders and farmers
- April to May 2017: Complete technical review of applications for incentives component that will reduce GHGs from on-farm management practices
- May 2017: Announce awardees for incentive component of the Healthy Soils Initiative
- May 2017: Establish contracts with growers for incentive component that fund projects that will have GHG reductions from on-farm management practices
- June 2017 to May 2018: Project implementation by growers over growing season
- December 2017 to May 2018: Project verification by CDFA and RCDs
- April to May 2018: Final invoicing and project completion
- June 2018: Completion of final report with quantitative GHG reduction from on-farm management practices

H. Supplemental Information

This proposal also includes one-time costs for communication equipment, computers and software, and furniture.

I. Recommendation

CDFA recommends approval of Alternative #1, providing \$75 million in one-time funding in FY 2016-17 to be available for encumbrance or expenditure until June 30, 2018 and \$2.523 million in FY 2017-18 and ongoing from the GGRF, and 20.0 ongoing positions to support SWEEP, the Dairy Digester Research and Development Program, and the Healthy Soils Program. Funds will support demonstration programs, incentive programs and staff to implement these programs which will provide GHG reductions and promote carbon sequestration to help limit climate change and provide a myriad of other benefits to California including critical water savings, generation of cleaner energy and increased SOM. These programs are fundamental programs of what is known as Climate Smart Agriculture and implemented under the authority of the Environmental Farming Act of 1995.